Testimony for the Record

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On behalf of the nuclear energy industry, the Nuclear Energy Institute (NEI) appreciates the opportunity to discuss legislative proposals to reduce greenhouse gas emissions.

NEI is responsible for defining and implementing nuclear industry policy on generic regulatory, financial, technical and legislative issues. NEI members include all companies licensed to operate commercial nuclear power plants in the United States, and hundreds of other companies and organizations that provide equipment, fuel and services to the nuclear energy industry.

NEI has taken no position on the specific legislative proposals currently before Congress. We leave to others the complex policy issues of how best to structure a program to reduce carbon emissions. Nonetheless, NEI is deeply engaged in, and committed to, the debate over climate policy. A year ago, the NEI Executive Committee endorsed a set of principles establishing nuclear industry policy on climate change. Those principles included support for federal action or legislation to reduce greenhouse gas emissions.

In this statement let me address two issues that should, we believe, be recognized and reflected in any legislative initiative to control carbon emissions.

First, we see a growing consensus that any credible program to reduce greenhouse gas emissions in the U.S. and worldwide will require a portfolio of technologies and approaches, and that nuclear energy is an indispensable part of that portfolio. This conclusion is supported by an impressive body of mainstream research and analysis.

And second, we believe it is imperative to address the major investment challenge facing the electric power sector as it seeks to develop and deploy the low-carbon and zero-carbon technologies necessary to reduce greenhouse gas emissions. Federal legislation must obviously include targets and timetables for carbon reduction, but legislation must also help provide industry the technology and the means to achieve those targets and timetables. In our view, that will require an aggressive program of financing support–more aggressive and ambitious than anything in place today.

The growing body of mainstream research and analysis shows that nuclear power is an important part of the portfolio required to reduce carbon emissions. The most recent came from the Organization for Economic Cooperation and Development (OECD)'s International Energy Agency (IEA) last week. The IEA's 2008 *Energy Technologies Perspective* asserts that "A global revolution is needed in ways that energy is supplied and used. Far greater energy efficiency is a core requirement. Renewables, nuclear power, and CO_2 capture and storage must be deployed on a massive scale."

Last week's IEA report amplifies the findings in its *World Energy Outlook*, the pre-eminent global energy forecast, which was published earlier this year. In the 2008 edition of that forecast, the IEA analyzed what must be done to stabilize the concentration of CO_2 in the atmosphere at 450 parts per million (ppm)–the level judged necessary by the Intergovernmental Panel on Climate Change to avoid irreversible damage. In that scenario, world nuclear generating capacity more than doubles–from 368 gigawatts today to 833 gigawatts in 2030. Even with this ambitious growth, the additional nuclear capacity does not shoulder the entire carbon reduction load: end-use energy efficiency, improved efficiency of coal-fired power plants, and major gains in CO_2 capture and storage are also necessary.

This conclusion–that nuclear power is an essential component of any carbon reduction initiative–is unambiguous and beyond question. It is shared by leaders and governments around the world, including Yvo de Boer, Executive Secretary of the United Nations Framework Convention on Climate Change. Mr. de Boer said last July that he had never seen a credible scenario for reducing carbon emissions that did not include nuclear energy.

In addition to policy leaders, the world's scientific community agrees that nuclear energy must play a significant role in meeting the dual challenges of electricity production and greenhouse gas reduction. The most recent assessment report from the Intergovernmental Panel on Climate Change identifies nuclear energy as one of the "key mitigation technologies."

Closer to home, analyses of the various legislative proposals that have come before Congress, including the modeling conducted by the Environmental Protection Agency and the Energy Information Administration, all show that nuclear plant construction must accelerate in a carbon-constrained world. In EIA's analysis of the Lieberman-Warner legislation, the model forecasts more new nuclear capacity than could realistically be built during the forecast period. And in those modeling runs where nuclear energy expansion is constrained, carbon emissions and carbon prices are higher, electric sector consumption of natural gas soars, electricity and gas prices are higher, and GDP losses are greater.

Given that additional nuclear power is essential, what then must we do ensure development and deployment of nuclear energy and the other clean energy technologies necessary to address the climate challenge?

We must start by facing the facts. The United States is increasingly dependent on older, less efficient, more costly generating capacity. We have roughly one million megawatts of electric generating capacity today, and almost one-half of that is more than 30 years old. Almost 20 percent is more than 40 years old. Continuing to operate that older, less efficient, generating capacity, continuing to defer capital investment in newer, cleaner, more efficient generating technologies, is frustrating our ability to achieve cleaner air and reduce carbon emissions, and will continue to do so.

Consensus estimates show that the electric sector must invest at least $1 trillion between now and 2020 for new generating capacity, new transmission and distribution, efficiency programs, and environmental controls. That is more than the book value of the entire existing electric power supply and delivery system, and it does not include the cost of carbon controls. Addressing this investment challenge–and we <u>must</u> address this problem–will require innovative approaches to financing.

Meeting these investment needs will require a partnership between the private sector and the public sector. The times demand innovative approaches, combining all the financing capabilities and tools available to the private sector, the federal government and state governments.

In terms of new nuclear plant construction, one of the most significant financing challenges is the cost of these projects relative to the size, market value and financing capability of the companies that will build them.

New nuclear power plants are expected to cost at least $6 to 7 billion. U.S. electric power companies do not have the size, financing capability or financial strength to finance new nuclear power projects on balance sheet, on their own–particularly at a time when they are investing heavily in other generating capacity, transmission and distribution infrastructure, and environmental controls. These first projects must have financing support–either loan guarantees from the federal government or assurance of investment recovery from state governments, or both.

The states are doing their part. Throughout the South and Southeast, state governments have enacted legislation or implemented new regulations to encourage new nuclear plant construction. Comparable federal government commitment is essential.

The modest loan guarantee program authorized by the 2005 Energy Policy Act was a small step in the right direction, but it does not represent a sufficient response to the urgent need to rebuild our critical electric power infrastructure. We believe the United States will need something similar to the Clean Energy Bank concept now under consideration by a number of members of Congress–a government corporation, modeled on the Export-Import Bank and the Overseas Private Investment Corporation, to provide loan guarantees and other forms of financing support to ensure that capital flows to clean technology deployment in the electric sector. Creation of such a financing entity should be an integral component of any climate change legislation.

Such a concept serves at least two national imperatives.

First, it addresses the challenge mentioned earlier–the disparity between the size of these projects relative to the size of the companies that will build them. In the absence of a concept like a Clean Energy Bank, new nuclear plants and other clean energy projects will certainly be built, but in smaller numbers over a longer period of time.

Second, federal loan guarantees provide a substantial consumer benefit. A loan guarantee allows more leverage in a project's capital structure, which reduces the cost of capital, in turn reducing the cost of electricity from the project. Electricity consumers–residential, commercial and industrial–are already struggling with increases in oil, natural gas and electricity prices. The high cost of energy and fuel price volatility has already compromised the competitive position of American industry. We know that the next generation of clean energy technologies will be more costly than the capital stock in place today. In this environment, we see a compelling case for federal financing support that would reduce consumer costs.

If it is structured like the loan guarantee program authorized by Title XVII of the 2005 Energy Policy Act, in which project sponsors are expected to pay the cost of the loan guarantee, such a program would be revenue-neutral and would not represent a subsidy.

The public benefits associated with a robust energy loan guarantee program–lower cost electricity, deployment of clean energy technologies at the scale necessary to reduce carbon emissions–are significant. That is why the U.S. government routinely uses loan guarantee programs to support activities that serve the public good and the national interest–including shipbuilding, steelmaking, student loans, rural electrification, affordable housing, construction of critical transportation infrastructure, and for many other purposes.

Achieving significant expansion of nuclear power in the United States will require stable and sustained federal and state government policies relating to nuclear energy. The new nuclear power projects now in the early stages of development will not enter service until the 2016-2020. Like all other advanced energy technologies, continued progress requires sustained policy and political support.

In closing let me assure you that the U.S. nuclear industry is moving forward as quickly as we are able to license, finance and build new nuclear plants in the United States. Seventeen companies or groups of companies are preparing license applications for as many as 31 new reactors. Nine applications for construction and operating licenses are currently under review by the Nuclear Regulatory Commission for a total of 15 new plants.

We expect four to eight new U.S. nuclear plants in operation by 2016 or so. Assuming those first plants are meeting their construction schedules and cost estimates, the rate of construction would accelerate thereafter. With the necessary investment stimulus and financing support, we could see approximately 20,000 MW of new nuclear capacity (that would be about 15 plants) on line in the 2020 to 2022 time frame, and 65,000 to 70,000 megawatts (or 45 to 50 plants) by 2030.

These plants will produce clean, safe, reliable electricity, around the clock, at a stable price, immune to price volatility in the oil and natural gas markets.

But construction of these new nuclear plants will have other benefits too. At the peak of construction, a nuclear plant will employ 2300 skilled workers and, on completion, approximately 700 workers to operate and maintain the plant. New nuclear plant construction will also lead to new investment in the supply chain–in new manufacturing facilities to produce pumps, valves, pipe, electrical cable and other equipment and components. That will create more jobs, new opportunities and higher economic growth, and allow the United States to reclaim economic opportunity that has moved overseas over the last several decades.